Supporting Information: "Visible Wavelength Color Filters using Dielectric Subwavelength Gratings for Backside-illuminated CMOS Image Sensor Technologies"

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In this Supporting Information, we present additional information on

Figure S1 Angular dependence of the color filters for *s*- and *p*-polarized light,

Figure S2 Angular dependence of the color filters with and without interference effect of the SiO_2 spacer layer,

Figure S3 Measured transmission spectra as well as simulation results for *s*- and *p*-polarized light,

Figure S4 Complex refractive index data measured for poly-Si, and

Figure S5 Schematic of the measurement setup used.

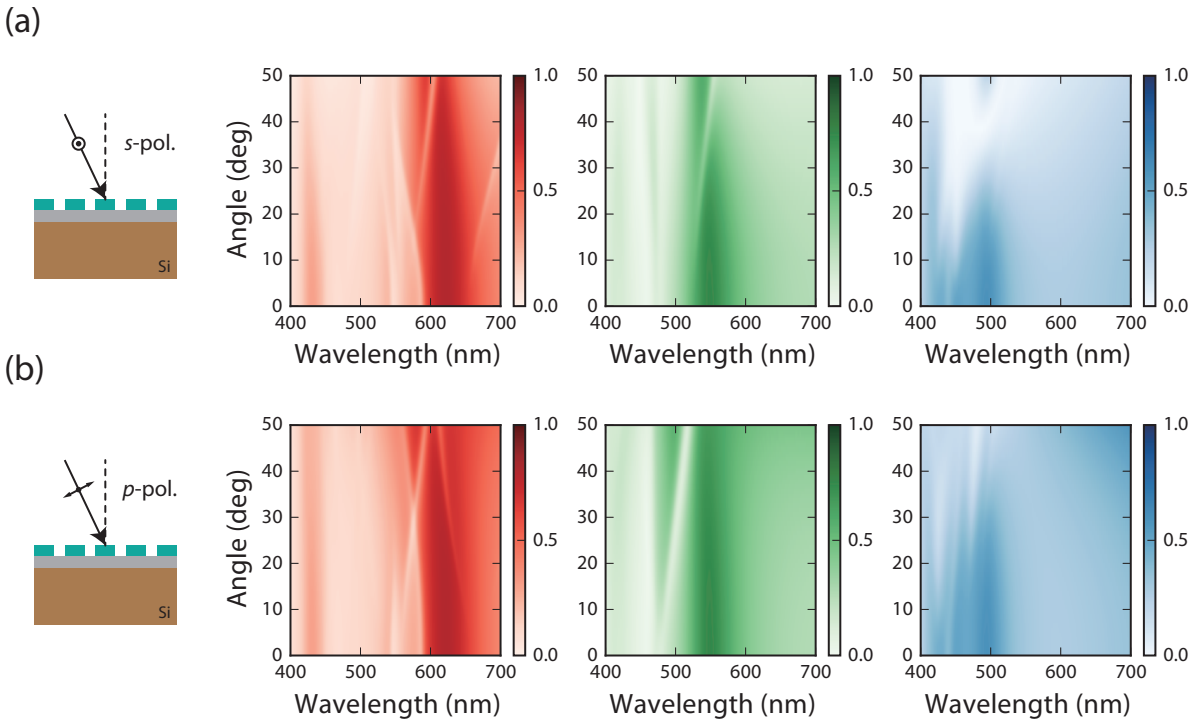

Figure S1: RCWA simulations of the angular dependence of the transmission spectra for (a) *s*- and (b) *p*-polarized light (See Figure 1(d) for unpolarized light).

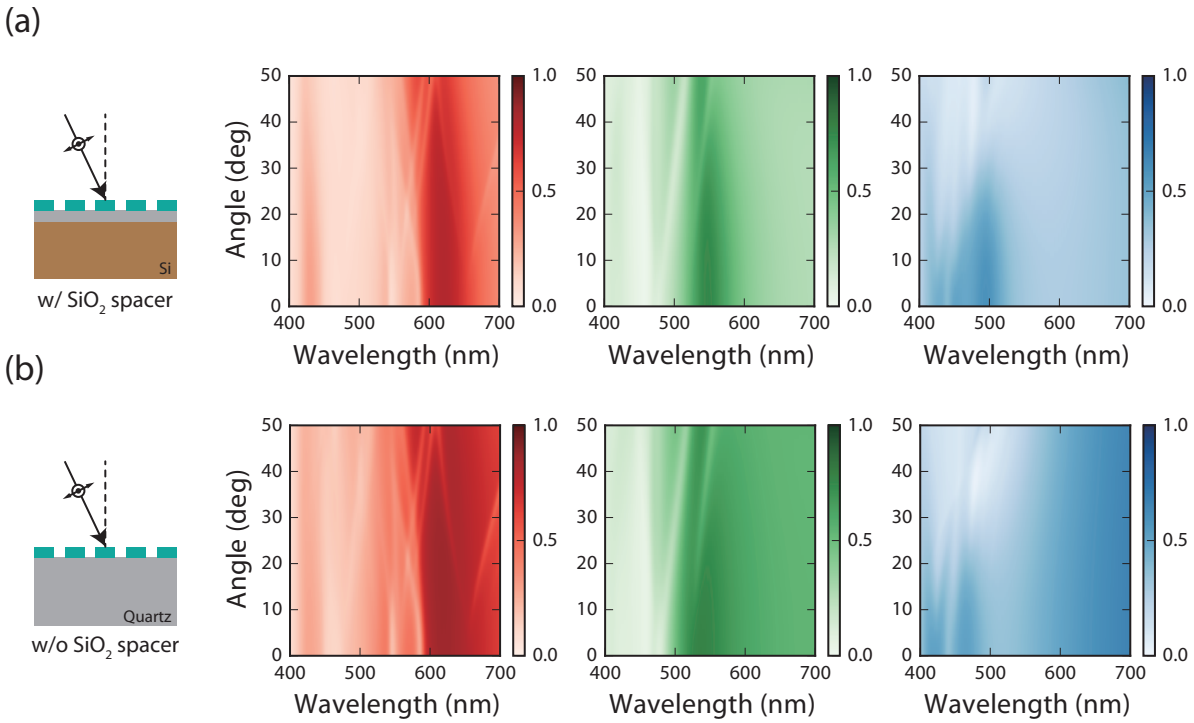

Figure S2: RCWA simulations of the angular dependence of the transmission spectra under unpolarized light illumination for the two cases: (a) with and (b) without SiO_2 spacers). The figures indicate that the angular dependence mainly arises from the angular response of the subwavelength grating layer, and that the effect of interference on the angular response is not significant.

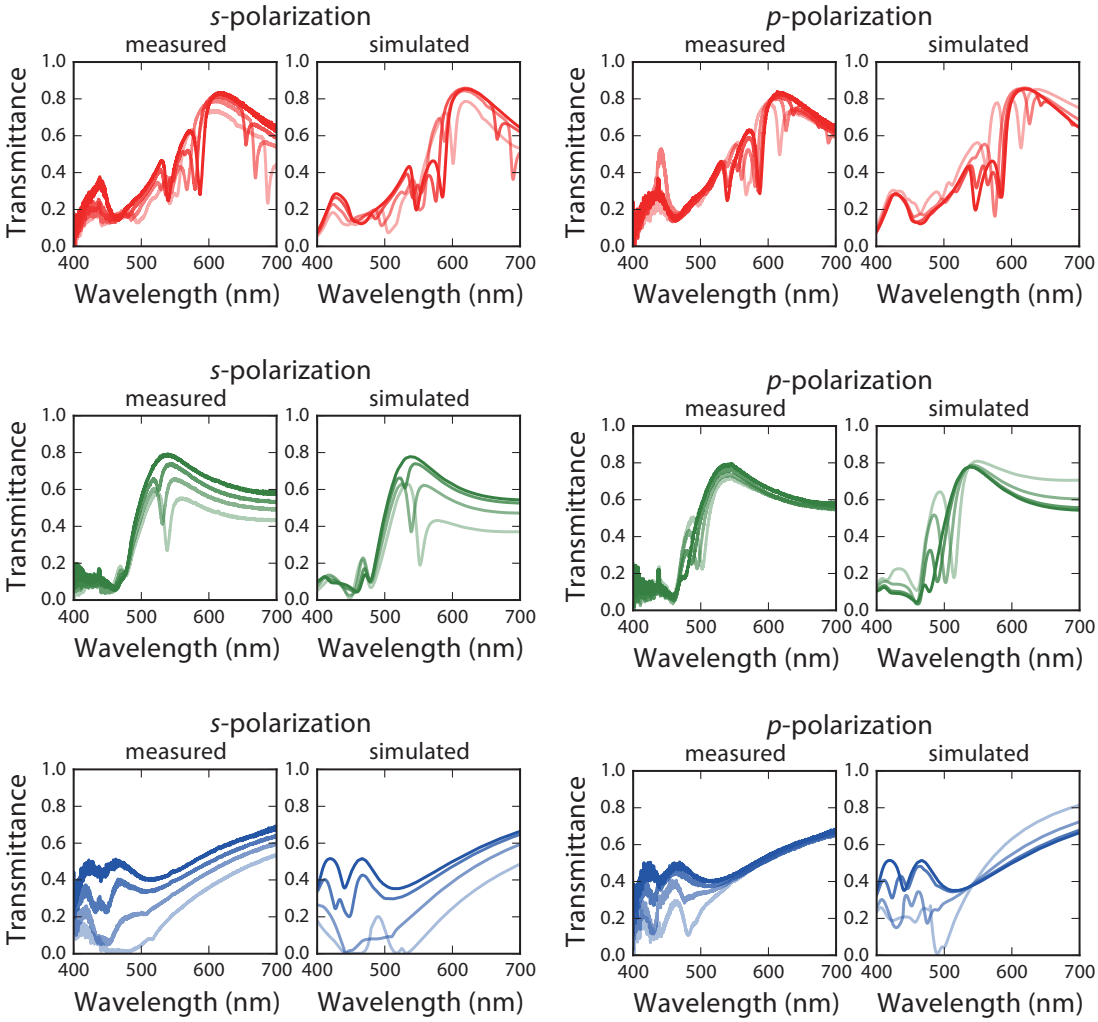

Figure S3: Measured (left) and simulated (right) transmission spectra of each color filter under oblique illuminations with *s*- and *p*-polarized light. For each filter, transmission spectra for incidence angles of 0°, 10°, 20°, and 30° are shown with successively lighter shades.

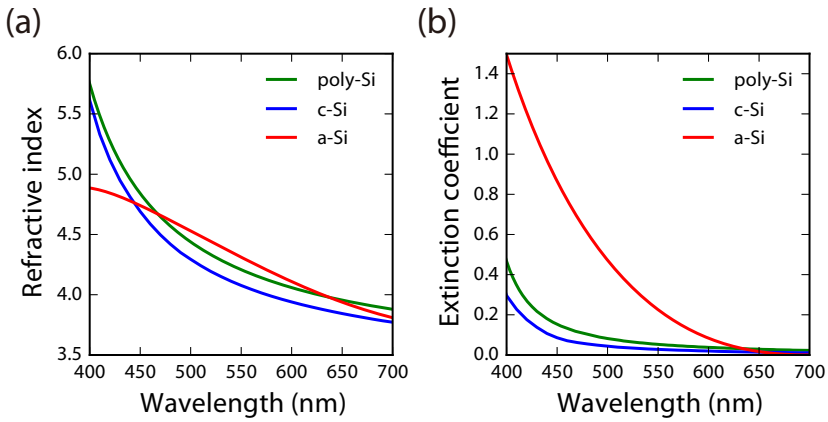

Figure S4: (a) Refractive indices and (b) extinction coefficients of poly-Si (measured), crystalline Si,[1] and amourphous Si (measured).

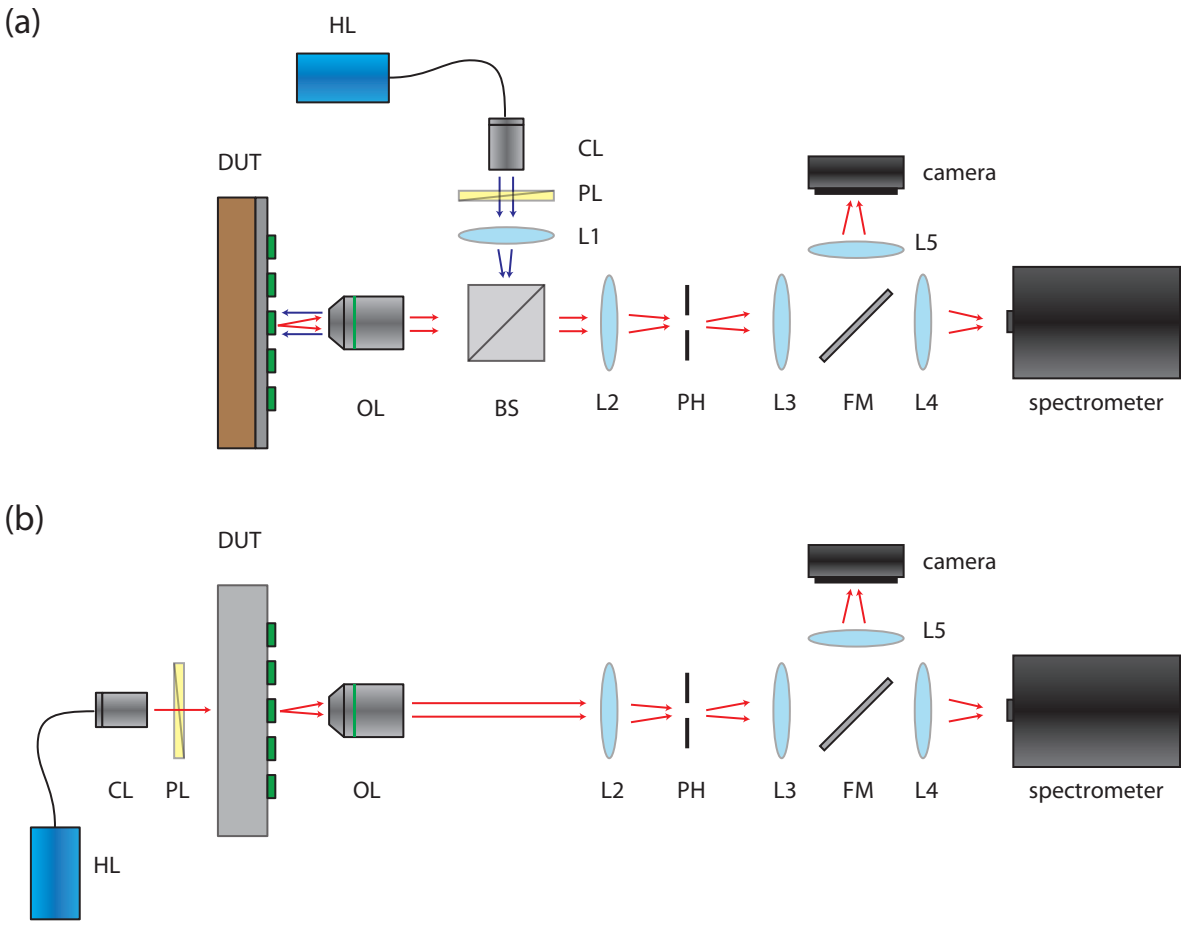

Figure S5: Measurement setups. (a) The measurement setup used to obtain reflection spectra for the color filters on the Si wafer. (b) The measurement setup used to obtain transmission spectra for the color filters on the quartz wafer. (HL: Halogen lamp, PL: polarizer, CL: collimator lens, OL: objective lens, DUT: device under test, L: lens, PH: pinhole, BS: beam splitter, and FM: flippable mirror)

References

(1) Green, M. A. *Sol. Energy Mater. Sol. Cells* **2008**, *92*, 1305–1310.